

ABSTRACT

A carbon nanotube-based device (40) includes a substrate (10), a number of catalytic nano-sized particles (131) formed on the substrate, and an aligned carbon nanotube array (15) extending from the alloy catalytic nano-sized particles. The aligned carbon nanotube array progressively bends in a predetermined direction. A method for making the carbon nanotube-based device includes the steps of: providing a substrate; depositing a layer of catalyst on the substrate; depositing a layer of catalyst-doped material on the catalyst layer, for varying a reaction rate of synthesis of the aligned carbon nanotube array; annealing the catalyst and the catalyst-doped material in an oxygen-containing gas at a low temperature; and exposing the nano-sized particles and catalyst-doped material to a carbon-containing source gas at a predetermined temperature such that the aligned carbon nanotube array grows from the substrate.